**Assignment 1**

#Laboratory Exercise 3, Home Assignment 1

.data # Vung du lieu, chua cac khai bao bien

x: .word    1    # bien x, khoi tao gia tri

y: .word    1    # bien y, khoi tao gia tri

z: .word    1    # bien z, khoi tao gia tri

.text               # Vung lenh, chua cac lenh hop ngu

la $a0, x      #Dua dia chi bien x vao thanh ghi a0

lw $t1,0($a0)  # dua gia tri bien x vao thanh ghi t1

la $a1, y      #Dua dia chi bien y vao thanh ghi a1

lw $t2,0($a1)  # dua gia tri bien y vao thanh ghi t2

la $a2, z      #Dua dia chi bien z vao thanh ghi a2

lw $t3,0($a2)  # dua gia tri bien z vao thanh ghi t3

addi $s1,$zero,3       #Thanh ghi$s1= 3 =i

addi $s2,$zero,2       #Thanh ghi$s2= 2=j

start:

slt $t0,$s2,$s1  # 2<3  j<i

bne $t0,$zero, else # branch to else if j<i

addi $t1,$t1,1  #  then part: x=x+1

addi $t3,$zero,1  # z=1

j endif   # skip “else” part

else:

addi $t2,$t2,-1  # begin else part: y=y-1

add $t3,$t3,$t3  # z=2\*z

endif:

**Assignment 2**

.data

A: .word  1,2,3,4,5

sum: .word 0

.text               # Vung lenh, chua cac lenh hop ngu

addi $s1,$zero,0       #Thanh ghi$s1= 0 =i

addi $s4,$zero,1       #Thanh ghi$s4= 1=step

addi $s3,$zero,5       #Thanh ghi$s3= 5=n

la $s2,A

la $a0, sum

lw $s5,0($a0)

loop:

add  $s1,$s1,$s4  #i=i+step

add  $t1,$s1,$s1  #t1=2\*s1

add $t1,$t1,$t1  #t1=4\*s1

add $t1,$t1,$s2  #t1 store the address of A[i]

lw $t0,0($t1)  #load value of A[i] in $t0

add $s5,$s5,$t0  #sum=sum+A[i]

bne $s1,$s3,loop #if i != n, goto loop

**Assignment 3**

#Laboratory Exercise 3, Home Assignment 3

.data

test: .word 2

a: .word 1

b: .word 2

.text

la $a0,a

lw $s2,0($a0)

la $a1,b

lw $s3,0($a1)

la $s0, test #load the address of test variable

lw $s1, 0($s0) #load the value of test to register $t1

li $t0, 0 #load value for test case

li $t1, 1

li $t2, 2

beq $s1, $t0, case\_0

beq $s1, $t1, case\_1

beq  $s1, $t2, case\_2

j default

case\_0:

addi $s2, $s2, 1  #a=a+1

j continue

case\_1:

sub $s2, $s2, $t1 #a=a-1

j continue

case\_2:

add $s3, $s3, $s3 #b=2\*b

j continue

default:

continue:

**Assignment 4**

**a.i<j**

.text               # Vung lenh, chua cac lenh hop ngu

addi $s1,$zero,3       #Thanh ghi$s1= 3 =i

addi $s2,$zero,2       #Thanh ghi$s2= 2=j

start:

slt $t0,$s1,$s2  # 2<3  i<j

beq $t0,$zero, else # branch to else if j<i

addi $t1,$t1,1  #  then part: x=x+1

addi $t3,$zero,1  # z=1

j endif   # skip “else” part

else:

addi $t2,$t2,-1  # begin else part: y=y-1

add $t3,$t3,$t3  # z=2\*z

endif:

**b.i>=j**

.text               # Vung lenh, chua cac lenh hop ngu

addi $s1,$zero,3       #Thanh ghi$s1= 3 =i

addi $s2,$zero,2       #Thanh ghi$s2= 2=j

start:

slt $t0,$s1,$s2  # i<j

bne $t0,$zero, else # branch to else if j<i

addi $t1,$t1,1  #  then part: x=x+1

addi $t3,$zero,1  # z=1

j endif   # skip “else” part

else:

addi $t2,$t2,-1  # begin else part: y=y-1

add $t3,$t3,$t3  # z=2\*z

endif:

**c.i+j<=0**

.text               # Vung lenh, chua cac lenh hop ngu

addi $s1,$zero,3       #Thanh ghi$s1= 3 =i

addi $s2,$zero,2       #Thanh ghi$s2= 2=j

add $s3,$s1,$s2 # Thanh ghi$s3 =i+j

start:

slt $t0,$zero,$s3  # 0<i+j

bne $t0,$zero, else # branch to else if j<i

addi $t1,$t1,1  #  then part: x=x+1

addi $t3,$zero,1  # z=1

j endif   # skip “else” part

else:

addi $t2,$t2,-1  # begin else part: y=y-1

add $t3,$t3,$t3  # z=2\*z

endif:

**d.i+j<=m+n**

.text               # Vung lenh, chua cac lenh hop ngu

addi $s1,$zero,3       #Thanh ghi$s1= 3 =i

addi $s2,$zero,2       #Thanh ghi$s2= 2=j

add $s3,$s1,$s2 # Thanh ghi$s3 =i+j

addi $s4,$zero,m       #Thanh ghi$s4=m

addi $s5,$zero,n       #Thanh ghi$s5=n

add $s6,$s4,$s5 # Thanh ghi$s6=m+n

start:

slt $t0,$s6,$s3  # m+n<i+j

bne $t0,$zero, else # branch to else if j<i

addi $t1,$t1,1  #  then part: x=x+1

addi $t3,$zero,1  # z=1

j endif   # skip “else” part

else:

addi $t2,$t2,-1  # begin else part: y=y-1

add $t3,$t3,$t3  # z=2\*z

endif:

**Assignment 5**

1. **i<n**

.text               # Vung lenh, chua cac lenh hop ngu

addi $s1,$zero,0       #Thanh ghi$s1= 0 =i

addi $s4,$zero,1       #Thanh ghi$s4= 1=step

addi $s3,$zero,5       #Thanh ghi$s3= 5=n

la $s2,A

la $a0, sum

lw $s5,0($a0)

loop:

add  $s1,$s1,$s4  #i=i+step

add  $t1,$s1,$s1  #t1=2\*s1

add $t1,$t1,$t1  #t1=4\*s1

add $t1,$t1,$s2  #t1 store the address of A[i]

lw $t0,0($t1)  #load value of A[i] in $t0

add $s5,$s5,$t0  #sum=sum+A[i]

 slt $s6,$s1,$ss3 #i<n

bne $s6,$zero,loop #if i < n, goto loop

1. **i<=n**

.text               # Vung lenh, chua cac lenh hop ngu

addi $s1,$zero,0       #Thanh ghi$s1= 0 =i

addi $s4,$zero,1       #Thanh ghi$s4= 1=step

addi $s3,$zero,5       #Thanh ghi$s3= 5=n

la $s2,A

la $a0, sum

lw $s5,0($a0)

loop:

add  $s1,$s1,$s4  #i=i+step

add  $t1,$s1,$s1  #t1=2\*s1

add $t1,$t1,$t1  #t1=4\*s1

add $t1,$t1,$s2  #t1 store the address of A[i]

lw $t0,0($t1)  #load value of A[i] in $t0

add $s5,$s5,$t0  #sum=sum+A[i]

 slt $s6,$s3,$s1 #n<i

beq $s6,$zero,loop #if i < =n, goto loop

1. **sum >=0**

.text               # Vung lenh, chua cac lenh hop ngu

addi $s1,$zero,0       #Thanh ghi$s1= 0 =i

addi $s4,$zero,1       #Thanh ghi$s4= 1=step

addi $s3,$zero,5       #Thanh ghi$s3= 5=n

la $s2,A

la $a0, sum

lw $s5,0($a0)

loop:

add  $s1,$s1,$s4  #i=i+step

add  $t1,$s1,$s1  #t1=2\*s1

add $t1,$t1,$t1  #t1=4\*s1

add $t1,$t1,$s2  #t1 store the address of A[i]

lw $t0,0($t1)  #load value of A[i] in $t0

add $s5,$s5,$t0  #sum=sum+A[i]

 slt $s6,$zero,$s5 #0<sum

bne $s6,$zero,loop #if sum>=0, goto loop

1. **A[i] ==0**

.text               # Vung lenh, chua cac lenh hop ngu

addi $s1,$zero,0       #Thanh ghi$s1= 0 =i

addi $s4,$zero,1       #Thanh ghi$s4= 1=step

addi $s3,$zero,5       #Thanh ghi$s3= 5=n

la $s2,A

la $a0, sum

lw $s5,0($a0)

loop:

add  $s1,$s1,$s4  #i=i+step

add  $t1,$s1,$s1  #t1=2\*s1

add $t1,$t1,$t1  #t1=4\*s1

add $t1,$t1,$s2  #t1 store the address of A[i]

lw $t0,0($t1)  #load value of A[i] in $t0

add $s5,$s5,$t0  #sum=sum+A[i]

beq $t0,$zero,loop #if A[i]== 0, goto loop

**Assignment 6**

.data

A: .word  1,9,5,4,3

sum: .word 0

.text               # Vung lenh, chua cac lenh hop ngu

addi $s1,$zero,0       #Thanh ghi$s1= 0 =i

addi $s5,$zero,1 #Thanh ghi $s5 =j=1

addi $s4,$zero,1       #Thanh ghi$s4= 1=step

addi $s3,$zero,5       #Thanh ghi$s3= 5=n

la $s2,A

la $a0, sum

lw $s5,0($a0)

loop:

add  $s1,$s1,$s4  #i=i+step

add  $t1,$s1,$s1  #t1=2\*s1

add $t1,$t1,$t1  #t1=4\*s1

add $t1,$t1,$s2  #t1 store the address of A[i]

lw $t0,0($t1)  #load value of A[i] in $t0

start:

add  $s5,$s5,$s4  #j=j+step

add  $t2,$s5,$s5  #t2=2\*s5

add $t2,$t2,$t2  #t2=4\*s5

add $t2,$t2,$s2  #t2 store the address of A[j]

lw $t3,0($t2)  #load value of A[j] in $t3

slt $t4,$t0,$t3 #A[i]<A[j]

bne $s4,$zero,loop #if A[i]<A[j], goto loop

endif: